

51. (New) The material of claim 15 wherein the inorganic particles comprise a phosphor composition.

52. (New) The material of claim 15 wherein the inorganic particles comprise a material with an index of refraction suitable for transmitting visible light.

53. (New) The material of claim 15 wherein the self-assembled structure has a photonic band gap that prevents propagation of light in any direction.

REMARKS

Claims 1-16 and 30-53 are pending. Claims 17-29 have been withdrawn from consideration. By this Amendment, claims 17-29 are canceled without prejudice. The specification has been amended to update references to copending applications. In addition, the specification was amended to incorporate the subject matter of claim 11, as filed, which was inadvertently not explicitly described in the body of the specification. Since the claims as filed are part of the disclosure, the amendment to the body of the specification to correspond to the claim is not new matter.

Claim 5 is amended for clarity. Claim 11 was amended to more particularly point out the subject matter of the invention. The amendment of claim 11 is supported by the specification, for example, at page 44, lines 20-23. New claims 41-53 are added.

New claims 41, 42 and 46 are supported by the specification, for example, at page 26, line 33 to page 27, lines 2-6. New claims 43 and 44 are supported by the specification, for example, at page 41, lines 7-21. New claim 45 is supported by the specification, for example, at page 29, lines 8-10. New claim 47 is supported by the specification, for example, at page 28, lines 1-2. New claim 48 is supported by the specification, for example at page 4, lines 16-17, 30-

32 and page 40, lines 2-4. New claim 49 is supported by the specification, for example, at page 42, lines 19-24. New claim 50 is supported by the specification, for example, at page 5, lines 2-7. New claim 51 is supported by the specification, for example, at page 44, lines 18-25. New claim 52 is supported by the specification, for example, at page 44, lines 3-7. New claim 53 is supported by the specification, for example, at page 43, lines 25-30. No new matter is added by the amendments or the new claims.

The pending claims stand rejected. Applicants respectfully request reconsideration of the rejections based on the following remarks.

Election/Restriction

The Examiner imposed a restriction under 35 U.S.C. §121 based on an assertion of three inventions in the claims as filed. Applicants have canceled claims 17-29 corresponding to group III. Applicants affirm their election of claims 1-16 of Group I with traverse.

To distinguish the claims of Group I and Group II, the Examiner referred to MPEP 806.05(g) apparatus for making products and corresponding products. However, Applicants do not believe that this section of the MPEP is relevant. The plurality of integrated devices in claims 30-40 is of a similar nature as the plurality of self-assembled structures in claims 1-16. Applicants believe that MPEP 806.03 would be more relevant relating to claims covering inventions with similar features. Applicants respectfully request the examination of claims 30-40 along with claims 1-16 of Group I.

Rejections Under 35 U.S.C. §112

The Examiner rejected claim 5 under 35 U.S.C. §112, second paragraph, as being indefinite. In particular, the Examiner indicated the term "generally" was a relative term and, therefore, made the claim indefinite. While Applicants do not agree that the use of the term

"generally" is unclear in all contexts, Applicants have deleted the term "generally" from claim 5. As amended, Applicants believe that claim 5 is definite. Applicants respectfully request withdrawal of the rejection of claim 5 under 35 U.S.C. §112, second paragraph, as being indefinite.

Rejection Under 35 U.S.C. §102 Over Clark et al.

The Examiner rejected claims 1, 9, 11 and 12 under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent 4,728,591 to Clark et al. (the Clark patent). The Examiner cited the Clark patent for disclosing a layer with a plurality of self-assembled structures comprising compositions. Applicants believe, however, that the Clark patent does not disclose all of the features of Applicants' claimed invention. Specifically, Applicants' claim 1 specifies that "the structures are localized in separate islands covering a portion of the layer in an integrated assembly." The Clark patent, however, does not disclose islands of self-assembled structures as described in Applicants' specification. Applicants respectfully request reconsideration of the rejection over the Clark patent.

It is well established that a reference only anticipates a claim if the reference explicitly or inherently discloses all of the claimed features. "Anticipation under 35 U.S.C. §102(e) [or other sections of 102] requires that 'each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference.'" In re Robertson, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999), citing Verdegaal Bros., Inc. v. Union Oil Co., 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, Kalman v. Kimberley-Clark Corp., 218 USPQ 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984).

Unfortunately, there is a terminology discrepancy between Applicants' claim and the terminology of the Clark patent. Claims are interpreted in view of the specification. As described in Applicants' specification, for example, at page 40, lines 2-4, each self-assembled

structure can include an array, possibly an ordered array, of materials within the structure. The self-assembled structures or islands are then integrated. For example, page 40, lines 11-23 and **Fig. 7**. The islands, as used by Applicants, are collections of separate isolated self-assembled structures, **not features within a particular self-assembled structure**.

In contrast, the Clark patent describes the use of a self-assembled molecular array of denatured protein to form an ordered array of holes through which material is deposited onto the underlying substrate. The resulting "islands" described in the Clark patent are elements of a self-assembled structure itself and **not** different, i.e., separate, self-assembled domains. Therefore, the Clark patent does not disclose "islands" as disclosed and claimed by Applicants. Since the Clark patent does not disclose all of the features of Applicants' claimed invention, the Clark patent does not anticipate Applicants' claimed invention.

Applicants respectfully request withdrawal of the rejection of claims 1, 9, 11 and 12 under 35 U.S.C. §102(b) as being unpatentable over the Clark patent.

Rejections Under 35 U.S.C. §102 Over Alivisatos et al.

The Examiner rejected claims 1, 3 and 8-12 under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent 5,751,018 to Alivisatos et al. (the Alivisatos patent). The examiner cited the Alivisatos patent for disclosing a layer with a plurality of self-assembled structures comprising compositions. Applicants believe that there has been a misunderstanding with respect to the relationship of the Alivisatos disclosure and Applicants' claimed invention. The Alivisatos patent does not disclose a plurality of separate islands of self-assembled material on a layer. Applicants respectfully request reconsideration of the rejection over Alivisatos patent.

Applicants' claims are directed to islands of self-assembled structures. Each island includes self-assembled materials within the array. The islands are spatially separated

such that different islands together do not cover a single self-assembled domain. For example, see page 40, line 19 to page 41, line 16 of Applicants' specification.

In contrast, the Alivisatos patent is directed to methods for forming a single domain of self-assembled particles. In particular, the Alivisatos patent does not disclose a plurality of separate islands of self-assembled material on a layer. Since the Alivisatos patent does not disclose features of the claimed invention, the Alivisatos patent does not anticipate Applicants' claimed invention.

Applicants respectfully request withdrawal of the rejection of claims 1, 3 and 8-12 under 35 U.S.C. §102(b) as being unpatentable over the Alivisatos patent.

Rejection Under 35 U.S.C. §103 Over Clark et al.

The Examiner rejected claim 13 under 35 U.S.C. §103(a) as being unpatentable over the Clark patent. The Examiner cited the Clark patent for the reasons relating to the anticipation rejection of claims 1, 9, 11 and 12. The Examiner further noted that the Clark patent disclosed biological molecules. The Examiner indicated that it would be obvious to a person of ordinary skill in the art to use biological macromolecules. Applicants respectfully request reconsideration based on the following comments.

As noted above, the Clark patent does not disclose a plurality of self-assembled islands, as that term is used in the present application. Since the Clark patent does not teach or suggest a plurality of islands of self-assembled material on a substrate, the Clark patent does not render claim 1 or any claims depending from claim 1 obvious.

Applicants respectfully request withdrawal of the rejection of claim 13 under 35 U.S.C. §103(a) as being unpatentable over the Clark patent.

Rejections Over Debe et al.

The Examiner rejected claims 1-8, 11, 12 and 15-16 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,879,827 to Debe et al. (the Debe patent). The Examiner cited the Debe patent for disclosing self-assembled layers. The Examiner indicated that absent features would be obvious based on routine skill in the art. Applicants believe that the same misunderstanding with respect to terminology is present with respect to the Debe patent. The Debe patent does not teach or suggest a plurality of islands of self-assembled material, with each island being a self-assembled domain. Applicants respectfully request reconsideration of the rejections based on the following comments.

The Debe patent describes the deposition of catalyst materials on a microstructured layer. See, for example, column 4, lines 19-25. The microstructure is an array of whiskers and the like. See, for example, column 5, lines 49-57 and column 6, lines 49-53. The discussion cited by the Examiner in the Debe patent of islands relates to the deposition of catalyst onto the whiskers. The Debe patent asserts that the catalyst can form islands on the microstructure. The **catalyst** on the microstructured material, however, is not even a self-assembled material. The catalyst is applied as a coating using known deposition approaches, such as CVD and PVD. See, for example, column 10, line 52 to column 13, line 7. Since the Debe patent does not teach or suggest the islands of self-assembled domains described and claimed by Applicants, the Debe patent does not render Applicants' claimed invention obvious.

With respect to claims 15 and 16, while the Debe patent describes the catalysts as particles, the catalyst material grows directly on the microstructure. Therefore, the catalyst material does not exist at any point as particles in the sense described in Applicants' specification since the materials are intimately anchored onto the microstructure material. Therefore, the Debe patent does not seem particularly relevant for these claims.

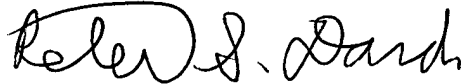
Applicants respectfully request withdrawal of the rejection of claims 1-8, 11, 12 and 15-16 under 35 U.S.C. §103(a) as being unpatentable over the Debe patent.

CONCLUSIONS

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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ATTACHMENT
MARKED-UP AMENDMENT

Specification As Amended

At page 10, lines 14-23, the paragraph was amended as follows:

The use of exclusively gas phase reactants is somewhat limiting with respect to the types of precursor compounds that can be used conveniently. Thus, techniques have been developed to introduce aerosols containing reactant precursors into laser pyrolysis chambers. Improved aerosol delivery apparatuses for reaction systems are described further in commonly assigned and copending U.S. Patent Application Serial Number 09/188,670, now U.S. Patent 6,193,936 to Gardner et al., entitled "Reactant Delivery Apparatuses," incorporated herein by reference.

At page 20, line 26 to page 21, line 6, the paragraph was amended as follows:

In one preferred embodiment of a commercial capacity laser pyrolysis apparatus, the reaction chamber is elongated along the light beam to provide for an increase in the throughput of reactants and products. The original design of the apparatus was based on the introduction of purely gaseous reactants. The embodiments described above for the delivery of aerosol reactants can be adapted for the elongated reaction chamber design. Additional embodiments for the introduction of an aerosol with one or more aerosol generators into an elongated reaction chamber is described in commonly assigned and copending U.S. Patent application serial No. 09/188,670, now U.S. Patent 6,193,936 to Gardner et al., entitled "Reactant Delivery Apparatuses," incorporated herein by reference.

At page 22, lines 12-31, the paragraph was amended as follows:

The improved reaction system includes a collection apparatus to remove the nanoparticles from the reactant stream. The collection system can be designed to collect particles in

a batch mode with the collection of a large quantity of particles prior to terminating production. Alternatively, the collection system can be designed to run in a continuous production mode by switching between different particle collectors within the collection apparatus or by providing for removal of particles without exposing the collection system to the ambient atmosphere. A[n] preferred embodiment of a collection apparatus for continuous particle production is described in copending and commonly assigned U.S. Patent application serial number 09/107,729, now U.S. Patent 6,270,732 to Gardner et al., entitled "Particle Collection Apparatus And Associated Methods," incorporated herein by reference. The collection apparatus can include curved components within the flow path similar to curved portion of the collection apparatus shown in Fig. 1.

At page 30, lines 9-19, the paragraph was amended follows:

In particular, the production of vanadium oxide nanoparticles is described in copending and commonly assigned U.S. Patent Applications Serial No. 08/897,778, now U.S. Patent 6,106,798 to Bi et al., entitled "Vanadium Oxide Nanoparticles," incorporated herein by reference. Similarly, silver vanadium oxide nanoparticles have been produced, as described in copending and commonly assigned U.S. Patent Applications Serial Nos. 09/246,076, now U.S. Patent 6,225,007, [to] and 09/311,506 [to], both entitled "Metal Vanadium Oxide Particles," both of which are incorporated herein by reference.

At page 30, line 27 to page 31, line 2, the paragraph was amended as follows:

Furthermore, lithium manganese oxide nanoparticles have been produced by laser pyrolysis along with subsequent heat processing, as described in copending and commonly assigned U.S. Patent Applications Serial No. 09/188,768 [to], entitled "Composite Metal Oxide Particles," Serial No. 09/203,414, now U.S. Patent 6,136,287 [to], entitled "Lithium Manganese Oxides and

Batteries," and 09/334,203 to Kumar et al., entitled "Reaction Methods for Producing Ternary Particles," all three of which are incorporated herein by reference.

At page 31, line 33 to page 32, line 9, the paragraph was amended as follows:

In addition, tin oxide nanoparticles have been produced by laser pyrolysis, as described in copending and commonly assigned U.S. Patent Application Serial No. 09/042,227, now U.S. Patent 6,099,798 to Kumar et al., entitled "Tin Oxide Particles," incorporated herein by reference. The production of zinc oxide nanoparticles is described in copending and commonly assigned U.S. Patent Application Serial Number 09/266,202 to Reitz, entitled "Zinc Oxide Particles," incorporated herein by reference. In particular, the production of ZnO nanoparticles is described.

At page 32, lines 10-27, the paragraph was amended as follows:

The production of iron and iron carbide is described in a publication by Bi et al., entitled "Nanocrystalline α -Fe, Fe_3C , and Fe_7C_3 produced by CO_2 laser pyrolysis," J. Mater. Res. Vol. 8, No. 7 1666-1674 (July 1993), incorporated herein by reference. The production of iron oxide nanoparticles is described in copending and commonly assigned U.S. Patent Application serial number 09/337,826, now U.S. Patent 6,080,337 to Kambe et al., entitled "Iron Oxide Particles," incorporated herein by reference. The production of nanoparticles of silver metal is described in copending and commonly assigned U.S. Patent Application Serial Number 09/311,506 to Reitz et al., entitled "Metal Vanadium Oxide Particles," incorporated herein by reference. Nanoscale carbon particles produced by laser pyrolysis are described in a reference by Bi et al., entitled "Nanoscale carbon blacks produced by CO_2 laser pyrolysis," J. Mater. Res. Vol. 10, No. 11, 2875-2884 (Nov. 1995), incorporated herein by reference.